GdP Dialisi Peritoneale | SIN Società Italiana Nefrologia

US di Dialisi Peritoneale
Spedali Civili di Brescia

# I° BRIXIA DP MEETING

## CORSO DI FORMAZIONE IN DIALISI PERITONEALE

# Quando iniziare la dialisi peritoneale: quali sono i tempi corretti e gli schemi più adatti per iniziare? Meglio con dose incrementale o è sempre necessaria la dose piena?

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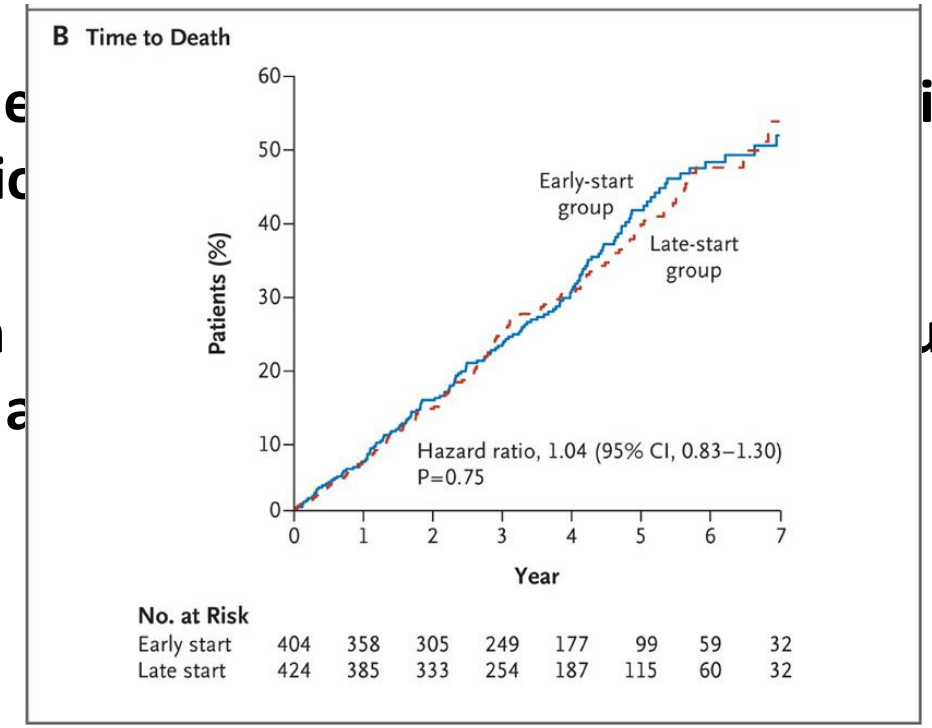
# When to start peritoneal dialysis: what are the correct times?

- **A specific estimated glomerular filtration rate (eGFR) value for initiating dialysis in the absence of symptomatic kidney failure has not been established.**

- **The IDEAL study did not demonstrate any clinical benefit in commencing dialysis at higher levels of eGFR (10-14 ml/min – early start *vs* 5-7 ml/min– late start).**

- **The variability in measureme it should not be considered to reliably reflect kidney functic**

- **Registry data indicate mean untries (average 8.5 in the UK, 9–10 in Canada and France, a**




Dialysis initiation: KDIGO Controversies Conference - Kidney International, 2019

# Current guidelines on initiation of dialysis in CKD stage 5

**European Renal Best Practice Advisory Board 2011**

In CKD stage 5 dialysis should be considered when there is one or more of the following: symptoms or signs of uraemia, inability to control hydration status or blood pressure or a progressive deterioration in nutritional status.

The majority of patients will be symptomatic and need to start dialysis with GFR in the range **9-6 mL/min/1.73m$^2$**.

*(Level 1A. Strong recommendation, high-quality evidence)*

**KDIGO Work Group 2013**

Dialysis should be initiated if at least one of the following: symptoms or signs due to CKD (serositis, acidbase or electrolyte abnormalities, pruritus), inability to control volume or BP, nutritional and/or cognitive impairment.

This often but not invariably occurs in the **5 to 10 ml/min/1.73 m$^2$ GFR range.**

*(Level 2B. Suggestion based on moderate quality of evidence)*

# When to start peritoneal dialysis: the initial PD prescription

**Approximately 10%–11% of patients with ESKD worldwide choose to perform peritoneal dialysis (PD).**

**Whereas the initial hemodialysis prescription tends to be relatively uniform and standardized, the initial PD prescription lends itself to a more individualized approach.**

# Prescribing high-quality goal-directed peritoneal dialysis

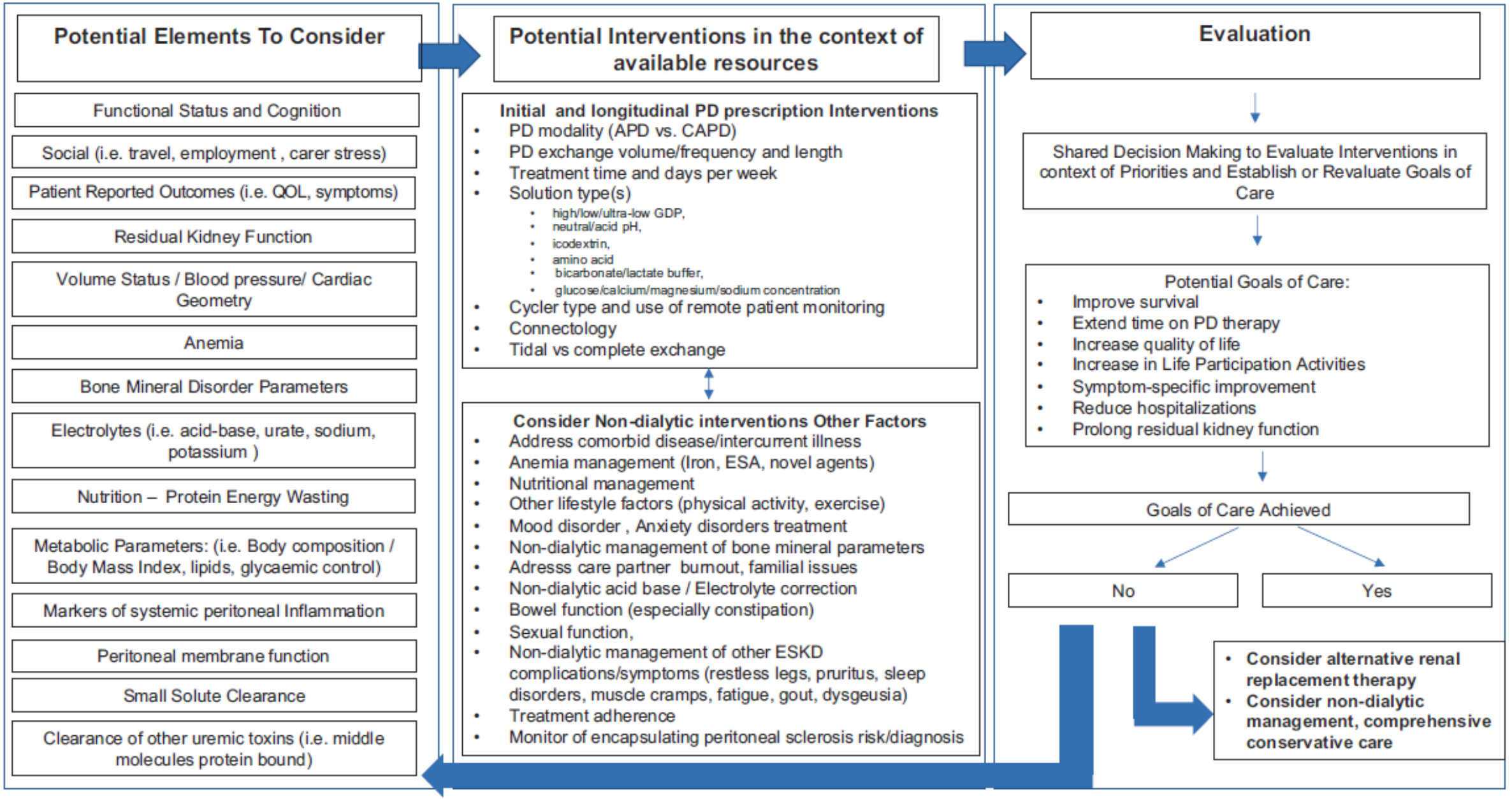
**Key recommendations**

I. PD should be prescribed using shared decision-making between the person doing PD and the care team. The aim is to establish realistic care goals that (1) maintain quality of life for the person doing PD as much as possible by enabling them to meet their life goals, (2) minimize symptoms and treatment burden while (3) ensuring high-quality care is provided.

**The physician and patient must work together to design a prescription that best fits the patient's lifestyle and achieves the desired clinical goals**

Brown et al. PDI 2020 – ISPD practice recommendations

# Prescribing Peritoneal Dialysis For High Quality Care




**Brown et al. PDI 2020 – ISPD practice recommendations**

# Prescribing high-quality goal-directed peritoneal dialysis

**Key recommendations**

III. A number of assessments should be used to help ensure the delivery of high-quality PD care.

a. **Patient reported outcome measures** – this is a measure of how a person doing PD is experiencing life and his/her feeling of well-being. It should take into account the person's symptoms, impact of the dialysis regimen on the person's life, mental health and social circumstances.

b. **Fluid status** is an important part of dialysis delivery. Urine output and fluid removed by dialysis both contribute to maintaining good fluid status. Regular assessment of fluid status, including blood pressure and clinical examination, should be part of routine care.

c. **Nutrition status** should be assessed regularly through evaluation of the patient's appetite, clinical examination, body weight measurements and blood tests (potassium, bicarbonate, phosphate, albumin). Dietary intake of potassium, phosphate, sodium, protein, carbohydrate and fat may need to be assessed and adjusted as well.

d. **Removal of toxins**. This can be estimated using a calculation called $Kt/V_{urea}$ and/or creatinine clearance. Both are measures of the amount of dialysis delivered. There is no high-quality evidence regarding the need or benefit associated with the achievement of a specific target value for these measures.

**Brown et al. PDI 2020 – ISPD practice recommendations**

# How to craft the prescription for patients starting Peritoneal Dialysis?

# TWO TYPES OF PERITONEAL DIALYSIS

FOUR EXCHANGES

MEAL TIME OR BED TIME

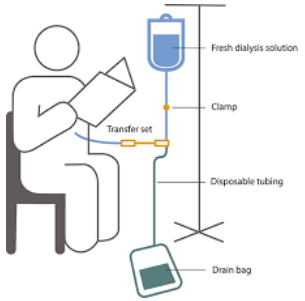
FOUR OR FIVE CYCLES

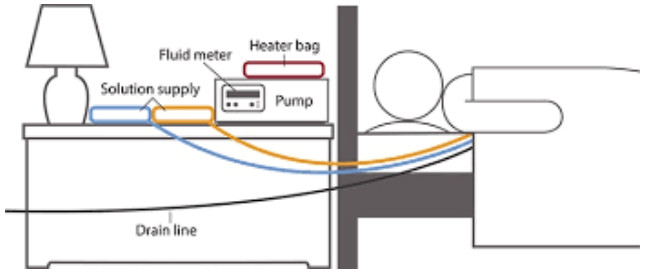
# Deciding on a PD Modality: CAPD vs APD

As a first step, the patient must decide whether to do PD in a manner that uses strictly manual exchanges, known as continuous ambulatory PD (CAPD), versus one using a cycler, known as automated PD (APD).

The physician can assist the patient with this decision by assessing the responses to the following questions:

- Must his/her dialysis be arranged around a work schedule and, if so, what are the work hours?
- Is the patient comfortable with the use of machinery or would s/he prefer a strictly manual method?
- When does he/she commonly go to sleep and arise?
- Is s/he willing to be connected to a machine, and therefore be “tethered” in place for an hour or two before and/or after usual sleep hours?



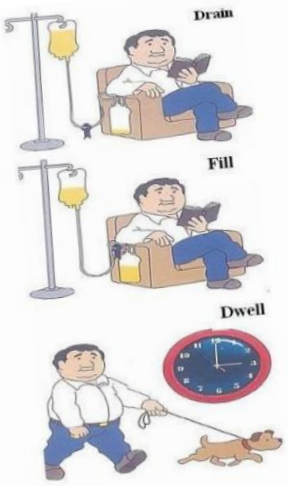

Teitelbaum, CJASN 2018

# Deciding on Timing and Duration of Treatment

The timing and duration of treatment should be tailored to the individual patient's lifestyle, matching the patient's wake–sleep pattern and accommodating the need to continue employment.

Rarely, patients sleep more than 8 hours; an APD prescription that ties the patient down for longer periods may cause him/her to retire for the evening early and lose precious family time.

Similarly, the patient who wishes to continue working should not be expected to perform a manual exchange during work hours.




Teitelbaum, CJASN 2018

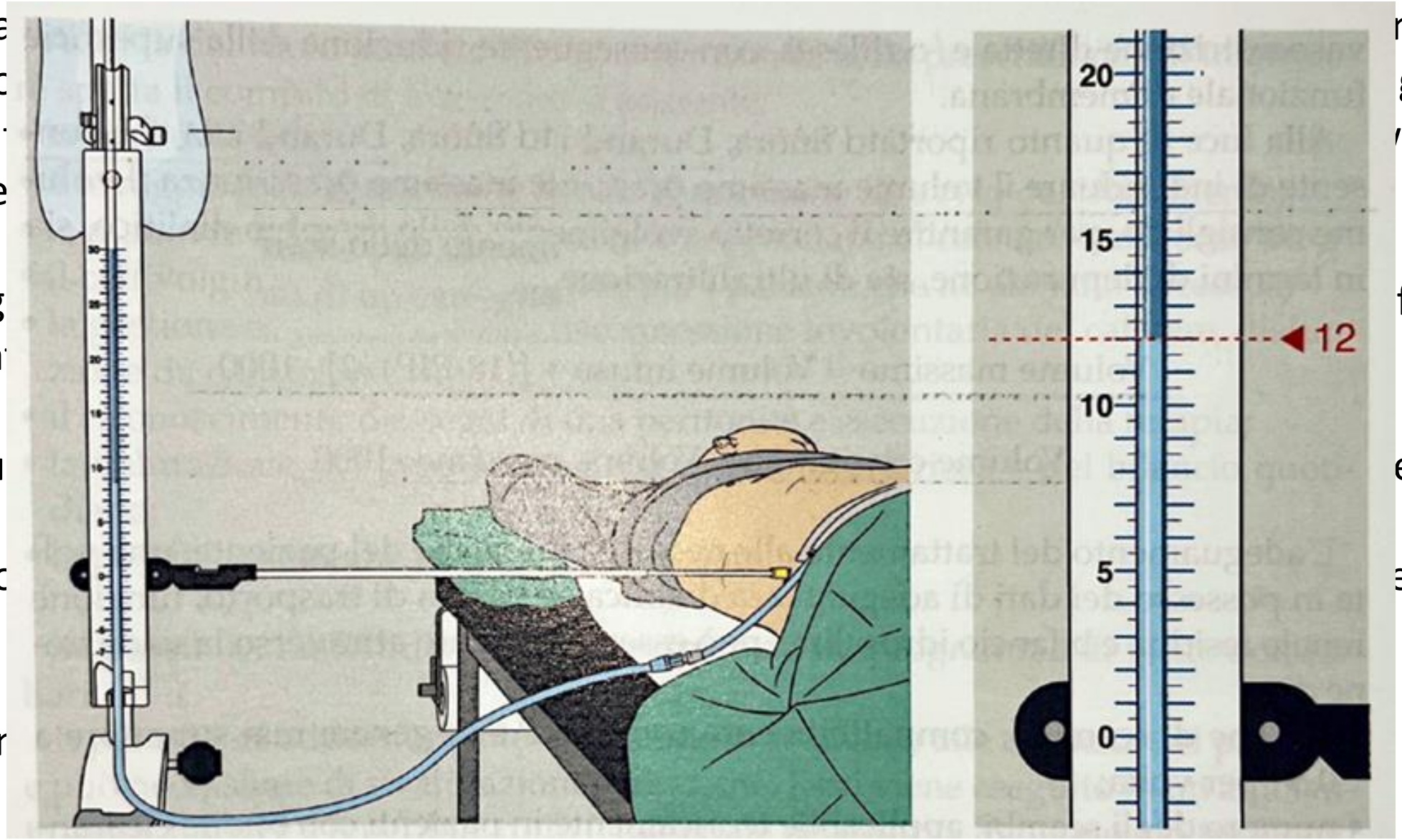
# Deciding on Dwell Volume and Number of Cycles

Patients a $m^2$ BSA. As
intraperitc ghest when
sitting, pa hen upright
during the

Increasing f dwells and
has a grea

Care shou ession. Each
exchange lysis occurs.
Furthermc ersely affect
clearance

Useful to r




Teitelbaum, CJASN 2018

# Estimating the Minimum Necessary Dialysis Dose to Achieve Adequate Small Solute Clearance

Recognizing that $Kt/V_{urea}$ is an imperfect measure of dialysis adequacy, it may nevertheless be useful as a starting point from which to estimate the initial volume of dialysis fluid to prescribe.

Standardized weekly Kt/Vurea in PD is expressed as:

$$(D_{urea}/P_{urea} * DV * 7)/Vd_{urea}$$

in which $D_{urea}$ and $P_{urea}$ are the urea concentrations measured in dialysate and plasma; DV, the drain volume per day, is the algebraic sum of the instilled volume and net ultrafiltration; and $Vd_{urea}$, the volume of distribution of urea, is assumed to be total body water (TBW).

# Practical considerations

# The Patient with Virtually No RKF

The suggested target for weekly $Kt/V_{urea}$ is 1.7. Therefore, the daily Kt/V would need to be one seventh of this and, for simplicity, this may be rounded to 0.25. Thus, for daily Kt/V to equal 0.25, the following relationship pertains:

$$(D_{urea}/P_{urea} * DV)/TBW = 0.25$$

The maximum ratio of $D_{urea}/P_{urea}$ obtainable is 1. Although not achieved in practice if we assume this to be the case, the DV needed to achieve the daily Kt/V of 0.25 is then equal to 0.25*TBW (0.6*weight [kg]).

This value, minus some arbitrarily selected value for net ultrafiltration (1 L is a reasonable first approximation), would then be the minimum volume of dialysis fluid one could prescribe and hope to have adequate small solute removal.

So, if our patient weighs 80 kg, we would estimate an initial prescription of at least 11 L of dialysis fluid ([80*0.6*0.25] - 1). Therefore, we might initially prescribe for example APD with four nightly exchanges of 2.5 L each and a last fill of 1 L.

**Teitelbaum, CJASN 2018**

# The Patient with Significant RKF

For the patient coming to PD with RKF, our approach may be adapted by measuring the daily residual urinary Kt/V ($U_{urea}/P_{urea}$*urine volume)/TBW), subtracting the resulting value from 0.25, and using this number instead of 0.25 in Equation to solve for DV.

So, if the same 80 kg patient has a plasma urea of 50 mg/dl and produces 1 L of urine daily with a urea concentration of 240 mg/dl, the daily residual urinary $Kt/V_{urea}$ would be (240/50 *1/48)= 0.1.

Subtracting this from 0.25 and then substituting 0.15 in place of 0.25 in Equation yields an estimate of 7.2 L for the needed DV.

Assuming the same 1 L of daily UF one would need a dose of just 6.2 L of dialysate; one might therefore prescribe just three nightly cycles of 2.1 L each in APD or 3 exchanges of 2 L in CAPD.

**This approach may feel cumbersome at first but, once used with frequency, becomes easy to use and practical.**

**Teitelbaum, CJASN 2018**

# Timing of the First Peritoneal Equilibration Test

Recent data indicates that peritoneal transport status has prognostic value regarding mortality and frequency of hospitalization.

However, because transport characteristics may change during the first few weeks on PD, the peritoneal equilibration test is generally not performed until the patient has been on PD for 4–6 weeks.

Therefore, results of the peritoneal equilibration test are not used in formulating the initial PD prescription.

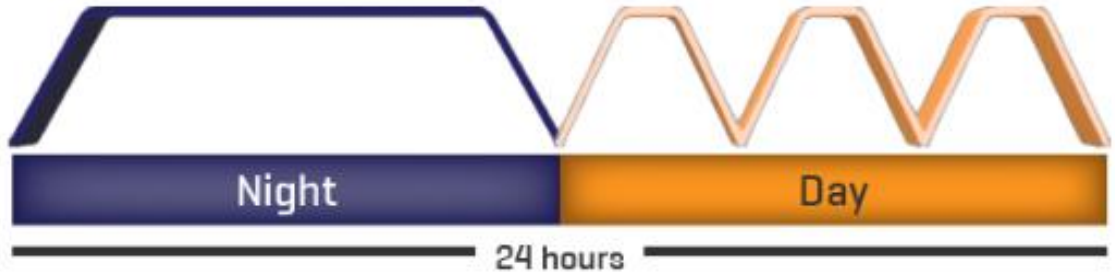
That said, the astute clinician, and very commonly the astute PD nurse, may notice that a patient has negative ultrafiltration (i.e., absorbs fluid) during a long dwell, suggesting that s/he is a rapid transporter.

The prescription should then be modified to avoid this if better ultrafiltration is needed.

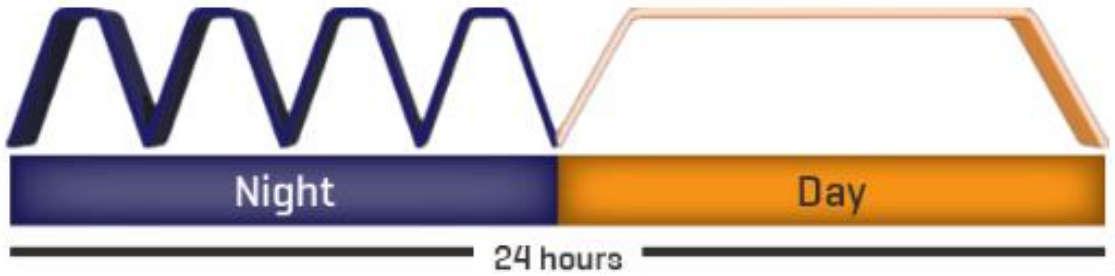
**Teitelbaum, CJASN 2018**

# The “usual” standard full dose PD prescription

- **In CAPD is usually considered 4 exchanges/day with three daily dweels (glucose 1.36%/1.5% or 2.27%-2.3%) and a long nocturnal dweel (icodextrin or glucose 2.27%)**




- **In APD a treatment with daily session 7 days a week with 3-5 cycles (glucose 1.36%/1.5% or 2.27%-2.3%) during night with (CCPD or CTPD) or without (NIPD) a long dweel during day (usually icodextrin)**

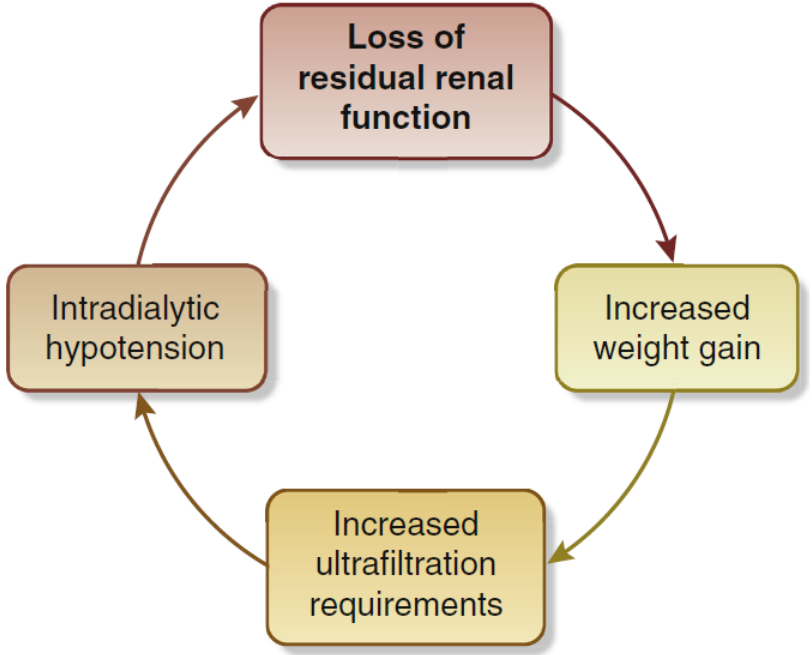


# Alternative to full-dose treatment?

Stage 5 CKD patients with complications unresponsive to conservative Tx

Start by Full Dose Dialysis

Loss of Residual Kidney Function




Brown, Kidney Int 2017

# *Incremental Peritoneal Dialysis*

# Current «proposed» definition

- A strategy by which less than the “standard dose” is prescribed so that the combination of residual renal and peritoneal clearance is sufficient to achieve individualized clearance goals.

**In the last 20 years, the studies published generally adopted different criteria to define incremental PD:**

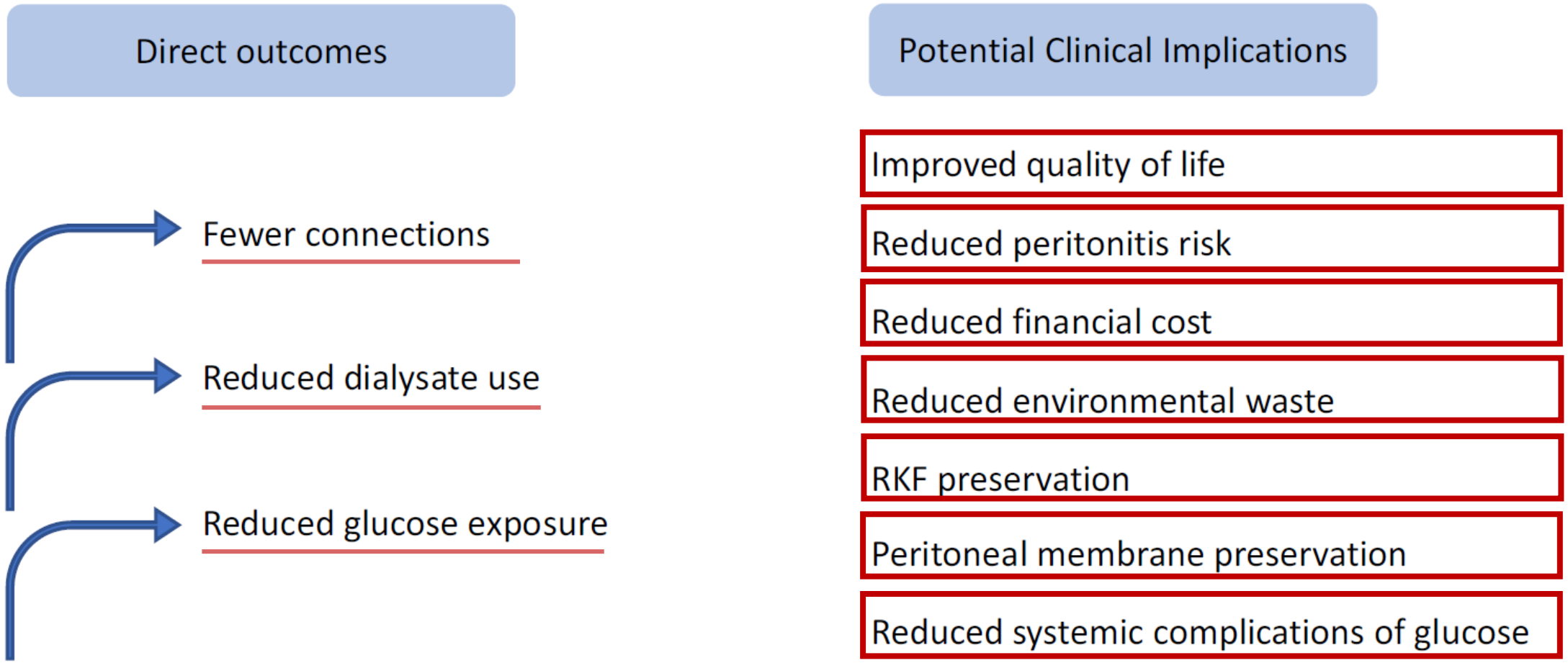
**CAPD as 1-2 dwells/day**

**APD as 3-4 sessions/week**

| CAPD | APD |
| --- | --- |
| - Smaller fill volumes<br>- Fewer number of exchanges per day<br>- Incorporate day(s) off<br>- No long dwell<br>- Icodextrin exchange only (once or twice a day) | - Smaller fill volumes<br>- Fewer number of exchanges on cycler<br>- Incorporate day(s) off, including use of IPD<br>- Nocturnal intermittent peritoneal dialysis (no day fill) |

Cheetham, KI Reports 2022

# Potential advantages of incremental PD…

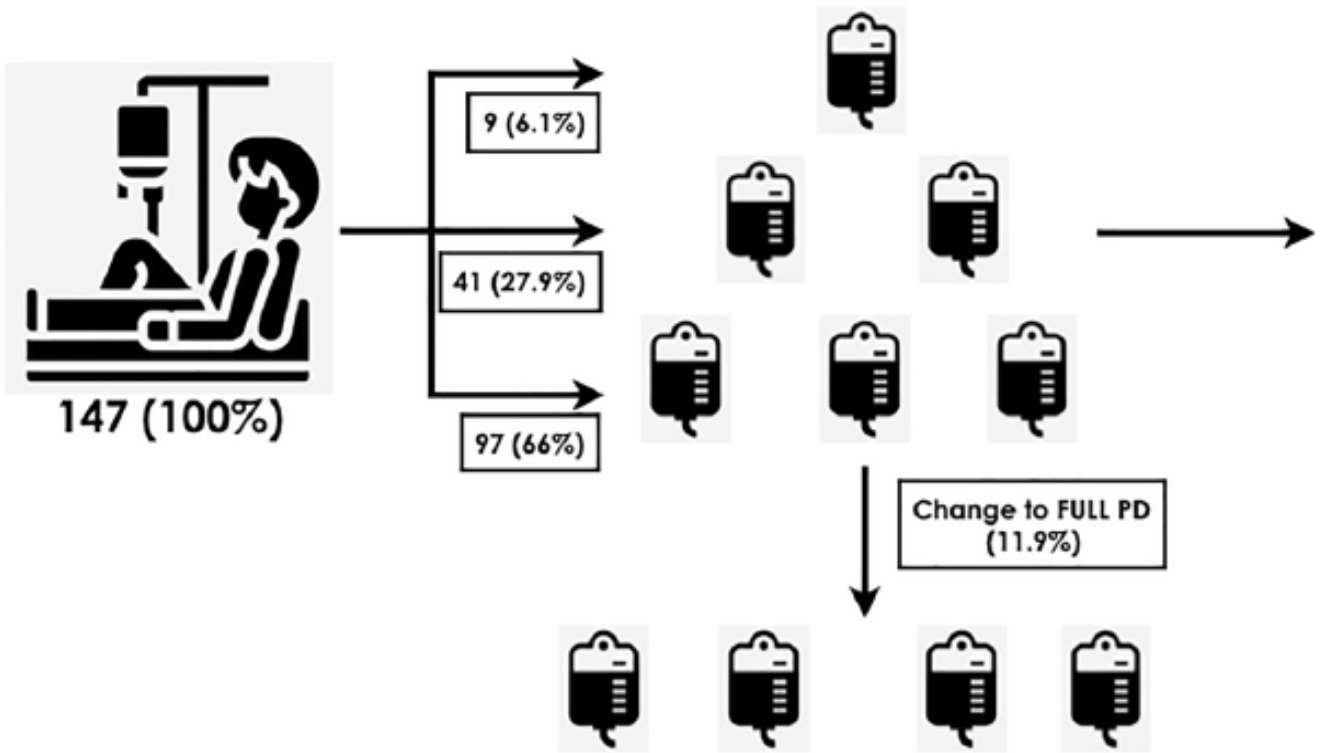



Cheetham, KI Reports 2022

# Economic and enviromental effects of incremental PD

**INCREMENTAL PD patients**

**INITIAL NUMBER of CAPD exchanges**




**BENEFITS**

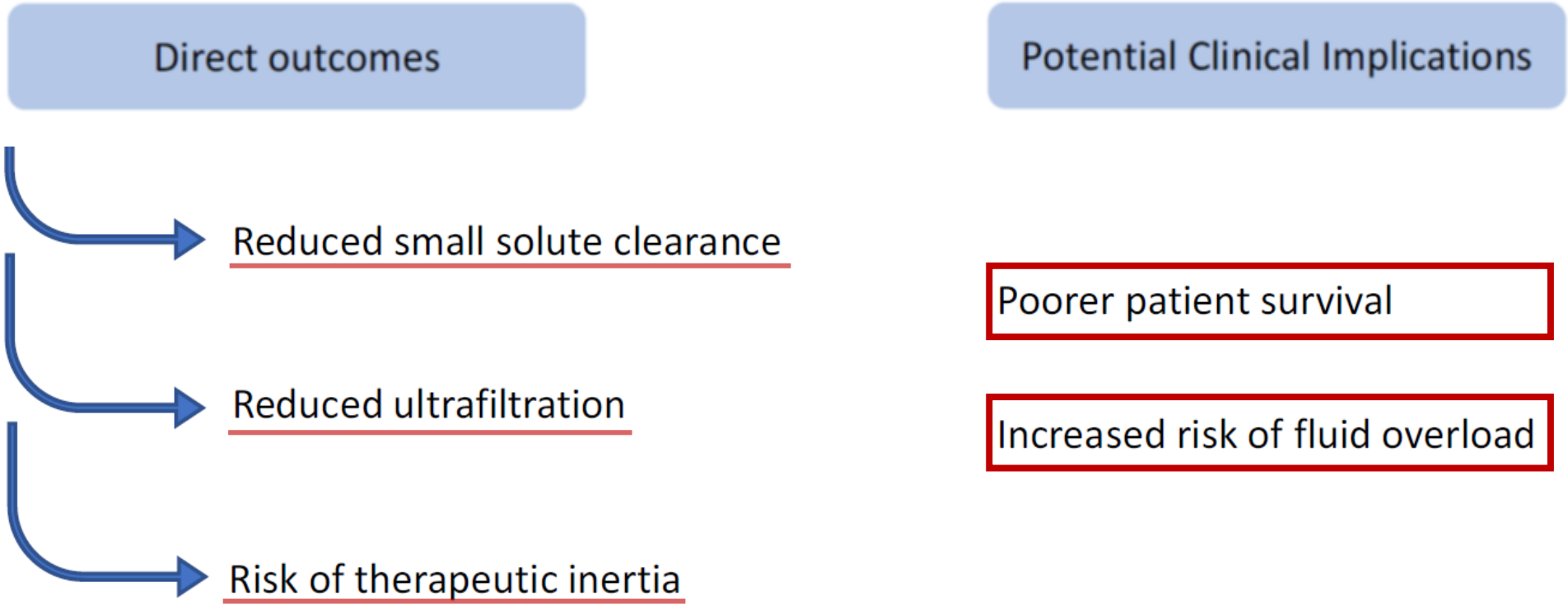
| | 1 EXCHANGE START | 2 EXCHANGES START | 3 EXCHANGES START | 2 EXCHANGES START 1 year incident patients (n=1652) |
|---|---|---|---|---|
| GLUCOSE EXPOSURE REDUCTION (kg/patient-year) | 20.4 | 14.8 | 8.3 | / |
| FREE-TIME GAIN (giorni/patient-year) | 18.1 | 13.1 | 7.4 | 25441 (days/year) |
| COST SAVING (€/patient-year) | 8700 | 6300 | 3540 | 12211584 (€/year) |
| PLASTIC WASTE REDUCTION (kg/patient-year) | 139.2 | 100.8 | 56.6 | 195386 (kg/year) |
| WATER CONSUMPTION REDUCTION (L/patient-year) | 25056 | 18144 | 10195 | 35169389 (L/year) |

## Conclusion

In comparison with full-dose PD, incremental PD allows to reduce the time spent for dialysis, glucose exposure, economic cost, plastic waste, and water consumption.

Nardelli, Journal of Nephrology 2022

# …and potential disadvantages




**How long could we continue with incremental PD?**

Cheetham, KI Reports 2022

# Incremental dialysis in ESRD: systematic review and meta-analysis

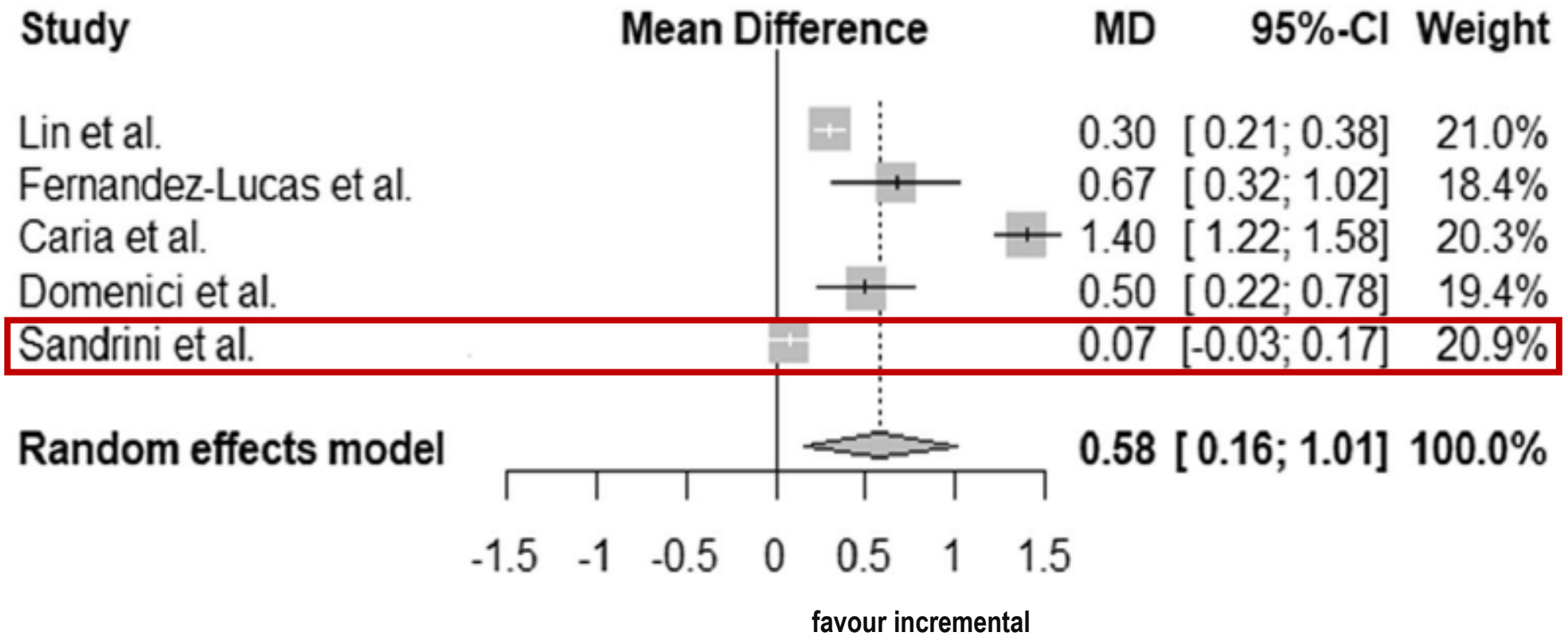
| Author/ Country (year) | Nr. Incremental/ Nr. Patients | Mean age | Male gender (%) | Baseline GFR (ml/min) | Type of GFR measurement | Diuresis (ml/day) | Incremental modality | Time to Full Dose (months) |
|---|---|---|---|---|---|---|---|---|
| Williams/UK (1999) | 15 | 51.9±16.8 | 66.7 | NA | NA | NA | CAPD (1 dwell/day) | 6 |
| De Vecchi/Italy (2000) | 25 | 61±13 | 76.0 | 6.2±2.1<br>3.5±1.2 | ClCr<br>ClUr | NA | CAPD (1-2 dwells/day) | 10.6 |
| Neri/Italy (2003) | 5 | 65.5 | 40 | 8.9 | Mean ClCr and ClUr | NA | APD (3-4 session/week) | 16.8 |
| Viglino/Italy (2008) | 11 | 66.1±10.3 | 63.6 | 7.3±2.7 | Mean ClCr and ClUr | NA | CAPD (2 dwells/day) | 9.7 |
| Domenici/Italy (2011) | 17 | 37±13 | 47 | 6.9±1.1 | Mean ClCr and ClUr | NA | NA | NA |
| Jeloka/India (2013) | 13/ 41 | 58±9.4 | 61.5 | 7.8±2.6 | NA | 1,265±316 | CAPD (1 dwell/day) | 18.8 |
| Sandrini/Italy (2016) | 29/ 105 | 63±12 | 55 | 5.74±1.34 | Mean ClCr and ClUr | NA | CAPD (1-2 dwells/day) | 17.0 |

**In incremental PD time to full-dose was 13.4 months [95% CI 8.7–18.2]**

Garofalo et al, JN 2019

# Incremental dialysis in ESRD: systematic review and meta-analysis

**GFR loss in incremental vs full-dose dialysis**




Garofalo et al, JN 2019

# Incremental *vs* full-dose dialysis in PD: clinical outcomes

- **No difference in survival**
- **Better preservation in residual kidney function**
- **Similar or small reduction in risk of peritonitis**

## Main limitations

- **No similar criteria for definition of IPD in most studies**
- **Small number of patients enrolled**
- **High heterogeneity in methods and results**
- **No data about conservative treatment (drugs, diet)**

**Cheetham, KI Reports 2022**

# *Alternative option:*

## *add-on low-dose peritoneal dialysis on top of comprehensive conservative Tx for CKD stage 5 patients*

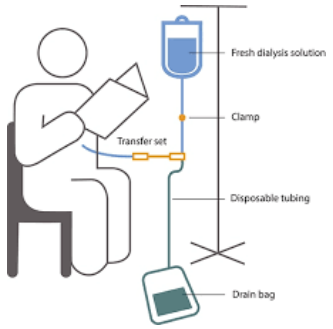
# *Integrated COnservative-PEritoneal dialysis: definition*

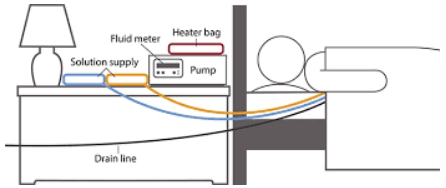
- Comprehensive conservative care

(anti-hypertensive drugs, RAAS-inhibitors, diuretics, anemia and MBD drugs, low or very low protein diet, low salt diet)

integrated with

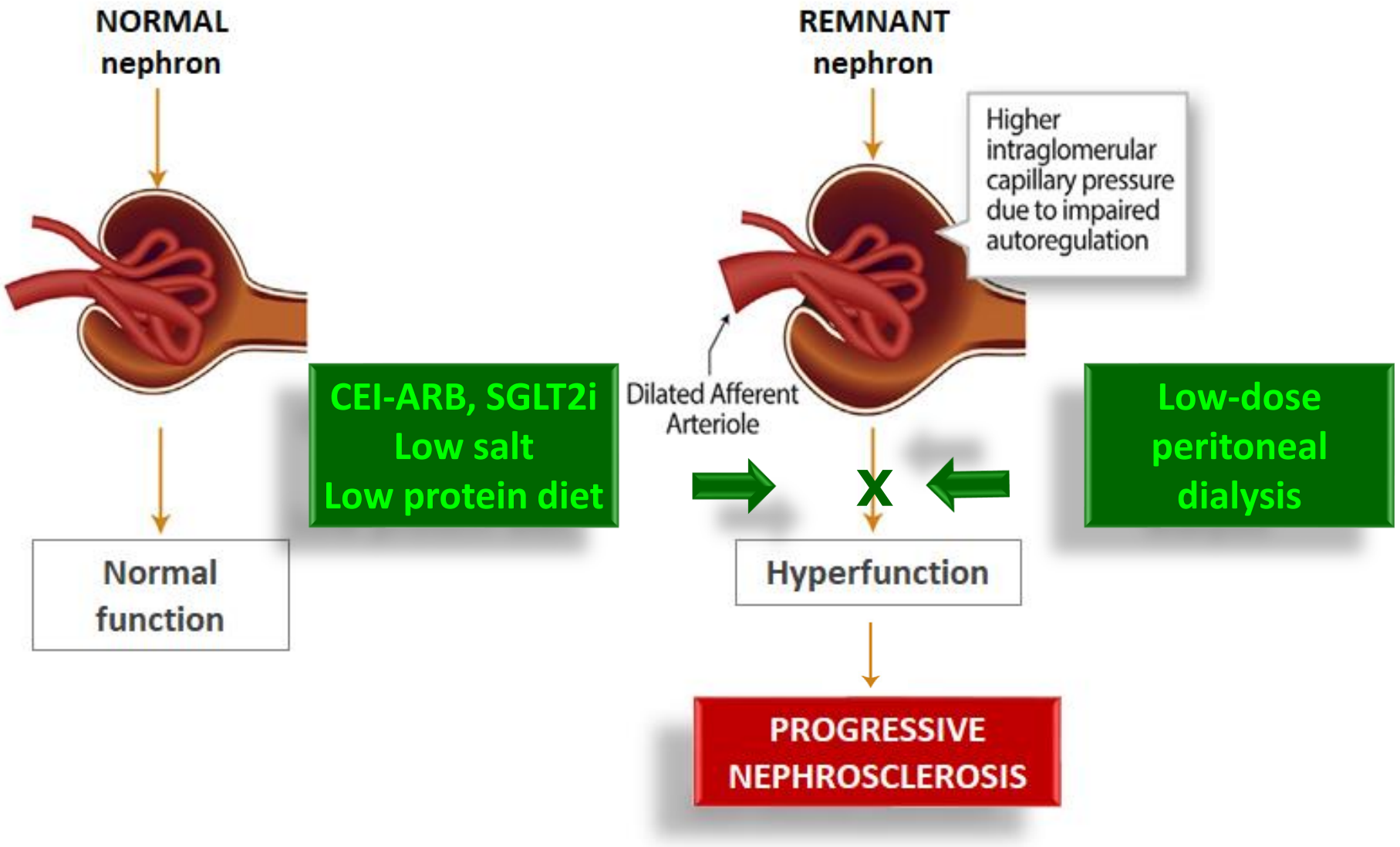

- Low dose of peritoneal dialysis defined as 1-2 exchanges on CAPD or 3-4 sessions/week in APD




**Garofalo…De Nicola, Oral Communication SIN 2022**

# Integrated therapy may not only improve volemic and metabolic picture…



# I-COPE CKD

Integrated COnservative-PEritoneal dialysis in CKD-stage 5

*I-COPE-CKD*

SIN RENI
SOCIETÀ ITALIANA NEFROLOGIA

# I-COPE CKD

## Design

Prospective Controlled Multicenter Study

## Aims

To evaluate the effects of add-on therapy with PD at low dose in CKD stage 5 patients under nephrology care and with complications poorly responsive to usual conservative therapy

## Primary Endpoint

Time to renal death: composite of all-cause death or kidney failure, defined as the need of “full dose” dialysis (≥3 exchanges/day for CAPD, or APD ≥5 sessions/week or HD start)

# I-COPE CKD: Patient selection

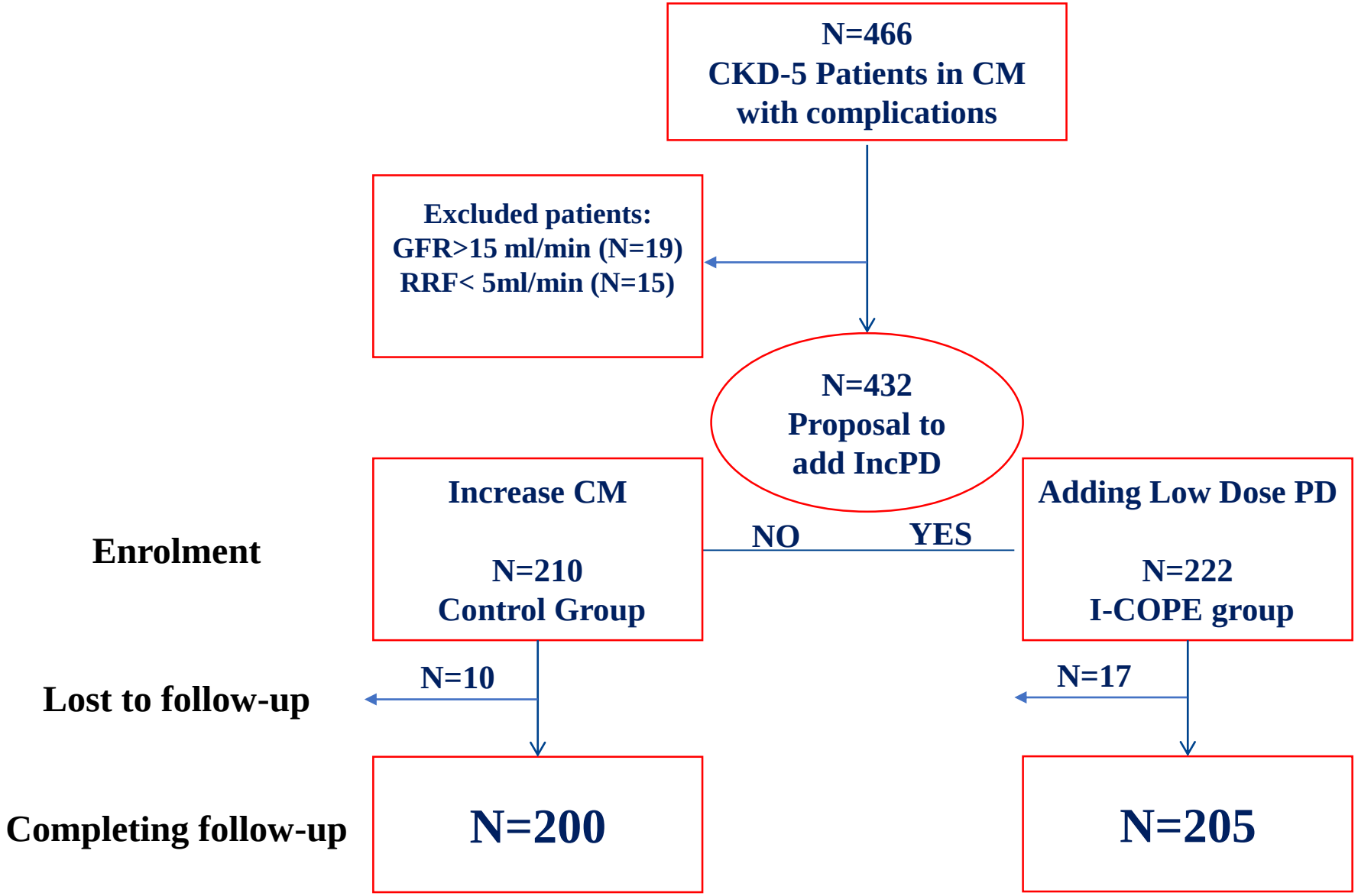
## Inclusion Criteria

- Age 18-85 y
- CKD-stage 5 (eGFR <15 mL/min/1.73 $m^2$)
- Treatment in the participating renal clinic from at least six months before enrollment
- Ability to understand and sign the informed consent
- Indications to RRT start according to current European and KDIGO guidelines recommendations: *"start RRT at CKD-stage 5 on the basis of clinical picture (complications poorly responsive to therapy)"*

## Exclusion Criteria

- eGFR MDRD <5 mL/min/1.73 $m^2$
- kidney transplantation
- cognitive impairment
- pregnancy or lactation
- chronic treatment with steroid or cytotoxic drugs
- acute kidney injury in the previous three months
- life expectancy of less than 1 year (e.g., active malignancy)
- absolute contraindications to PD

# I-COPE CKD: flow-chart



# I-COPE CKD: *Enrolment features*

24 PD centers in Italy

| | ICOPE (N=205) | CONTROL (N=200) | P |
|---|---|---|---|
| **Age (years)** | 63.3±14.2 | 65.3±14.2 | 0.166 |
| **Male Gender (%)** | 66.8 | 48.0 | **<0.001** |
| **Diabetes (%)** | 29.3 | 26.5 | 0.580 |
| **CVD (%)** | 36.1 | 30.3 | 0.275 |
| **Estimated GFR by MDRD (ml/min/1.73 $m^2$)** | 8.5±2.5 | 8.8±1.6 | 0.149 |
| **Complications (N)** | 3.5±1.5 | 3.3±1.5 | 0.199 |

**Nephrology care prior to study (months): 64 [19-143]**

# I-COPE CKD:

## *Factors uncontrolled by conservative therapy in I-COPE arm*

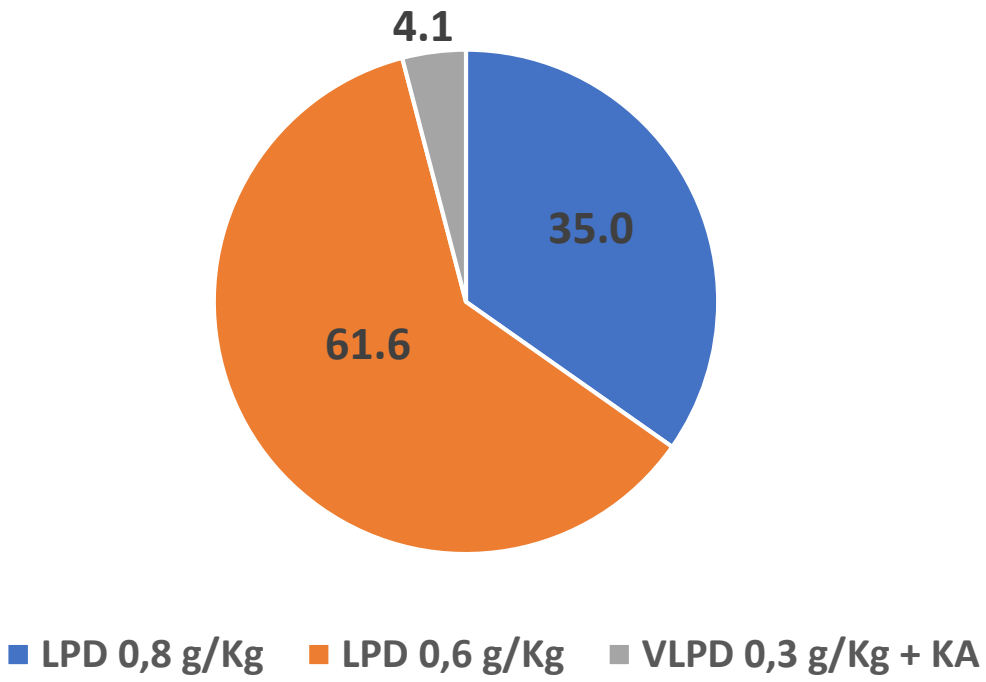
| Number of uncontrolled factors | 3 [2-4] |
|---|---|
| Uncontrolled factors/patient | % patients |
| 2 | 29 |
| 3 | 33 |
| >3 | 38 |

| | |
|---|---|
| Fatigue/Malaise (%) | 88.3 |
| Refractory hypertension (BP>140/90) (%) | 50.2 |
| Hospitalizations for CKD (%) | 41.0 |
| Nutritional worsening (%) | 40.0 |
| Ichting (%) | 23.4 |
| Refractory MBD alterations (%) | 22.9 |
| Uremic neuropathy (%) | 12.7 |
| Refractory hyperkalemia (%) | 12.7 |
| Refractory anemia (%) | 12.2 |
| Urea >250 mg/dl (%) | 7.8 |
| Refractory acidosis (%) | 7.3 |
| Hemorrhagic diathesis (%) | 6.3 |

# I-COPE CKD:

## *Nutritional treatment at baseline - ICOPE arm*

**72% of patients followed a low-protein diet at enrollment**




**As for the nutritional intervention, it is suggested (<u>but not mandatory</u>) patients be kept on low sodium-low protein diet from at least three months before baseline**
**(30-35 kcal/kg/day, 0.6-0.8 g/kg/day protein with/without ketoanalogues, phosphorus 600-800 mg/day, NaCl 5-6 g/day)**

# I-COPE CKD:

## *Main baseline lab data – ICOPE arm*

| | |
|---|---|
| Urea (mg/dL) | 152±59 |
| Potassium (mEq/L) | 4.6±0.6 |
| Calcium (mg/dL) | 9.1±0.7 |
| Phosphate (mg/dL) | 4.9±1.0 |
| PTH (pg/ml) | 190 [107-303] |
| Albumin (g/l) | 3.8±0.5 |
| Hemoglobin (g/dl) | 11.2±1.2 |
| Bicarbonate (mEq/L) | 24.2±3.5 |
| LDL cholesterol (mg/dL) | 84±33 |
| BNP (pg/ml) | 336 [72-1459] |

| | |
|---|---|
| 24 h Urinary Protein excretion (g/day) | 1.6 [0.7-3.2] |
| 24h Na Uv (mEq/day) | 133±61 |
| 24h K Uv (mEq/day) | 34±28 |
| 24h Phosphate Uv (mg/day) | 366 [183-493] |
| 24h Urea excretion (mg/dl) | 498 [344-661] |
| 24h Creatinine excretion (mg/dl) | 49 [40-63] |
| Creat Clearance (ml/min/1.73m$^2$) | 11.6±5.1 |
| Urea Clearance (ml/min/1.73m$^2$) | 5.3±2.6 |
| Mean Creat-Urea Clearance BSA (ml/min/1.73m$^2$) | 8.2±3.1 |
| Urinary output (ml/day) | 2070±626 |

# I-COPE CKD:

## *Pharmacological treatment in ICOPE arm at baseline*

| | |
|---|---|
| Calcium supplement (%) | 11.4 |
| Phosphate binders (%) | 60.1 |
| Vitamin D-native (%) | 38.2 |
| Calcitriol (%) | 38.0 |
| Paricalcitol (%) | 15.6 |

| | |
|---|---|
| K-binders (%) | 10.1 |
| Sodium bicarbonate (%) | 56.3 |
| Iron (%) | 35.5 |
| ESA | |
| Epoetin alfa, beta, zeta (%) | 35.0 |
| Darbepoetin (%) | 31.3 |
| CERA (%) | 8.8 |

# I-COPE CKD:

## *BP control and anti-HT drugs in ICOPE arm at baseline*

Office SBP (mmHg ): 136±15

Office DBP mmHg: 77±11

ABPM (N=76)

24h SBP (mmHg): 133±15

24h DBP (mmHg): 79±11

Daytime SBP (mmHg): 135±16

Daytime DBP (mmHg): 81±11

Night-time SBP (mmHg): 127±18

Night-time DBP (mmHg):74±11

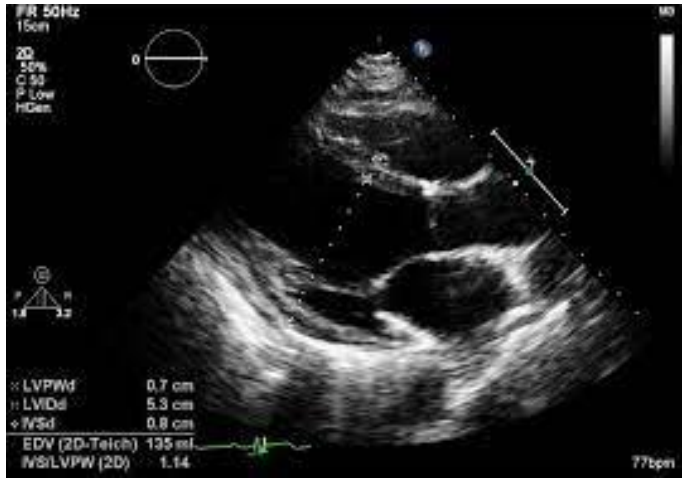
% dipping SBP: 6.7 [-1.0–11.3]

| Anti-hypertensive drugs (N) | 2[1-3] |
|---|---|
| RAS-inhibitors (%) | 36.0 |
| Calcium channel blockers (%) | 65.5 |
| Beta-blockers (%) | 53.5 |
| Alfa-2 agonists (%) | 8.5 |
| Alfa-1 blockers (%) | 24.1 |
| Diuretics<br>Furosemide (%)<br>Thiazide (%)<br>MRA (%) | <br>70.5<br>1.5<br>6.0 |
| Furosemide dose (mg) | 100 [50-250] |

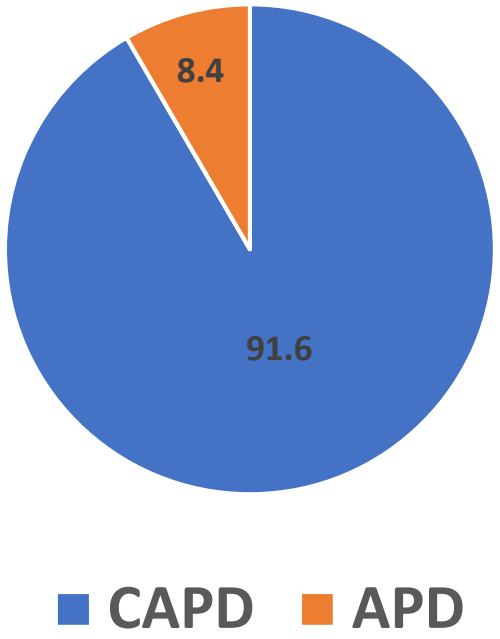
# I-COPE CKD: Echocardiography and body composition analysis

| Echocardiography (N=87) | |
|---|---|
| Left Atrial diameter (mm)<br>Left Atrial volume (ml/m²) | 41±9<br>53±27 |
| Ejection fraction (%) | 59±7 |
| Inferior vena cava diameter (mm) | 17±5 |

| BCM (N=78) | |
|---|---|
| Overhydration (L) | 1.2 [0.3-2.4] |
| Extracellular Body Water (L)<br>Total Body Water (L) | 17±6<br>35±10 |
| Lean Tissue index (Kg/m²)<br>Fat Tissue Index (Kg/m²) | 14±4<br>10±4 |




# I-COPE CKD: *PD prescription at baseline*




**CAPD prescription:**

- 1 exchange: 54%
- 2 exchanges: 46%

**APD prescription:**

- 3 sessions/week: 31%
- 4 sessions/week: 69%

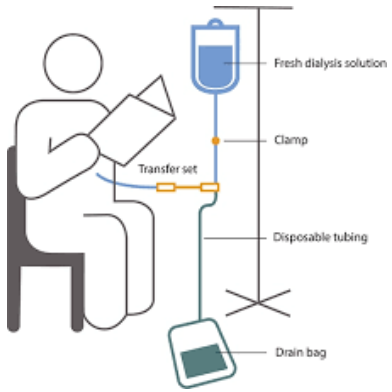
# I-COPE CKD: *Type of bags used at baseline*

## CAPD

- Icodextrin: 65%
- Glucose 1.36/1,5%: 56%
- Glucose 2.27/2.3%: 12%

**Mean CAPD overall volume:**

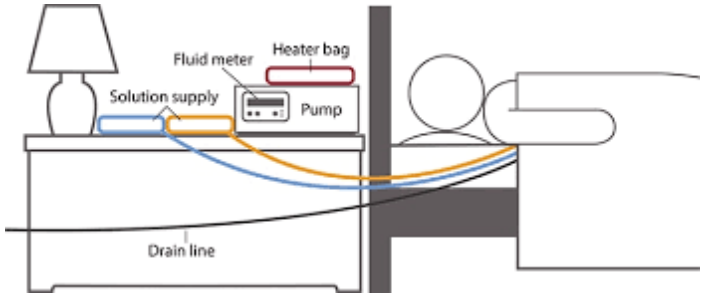
**3.2±0.7 L/day**




## APD

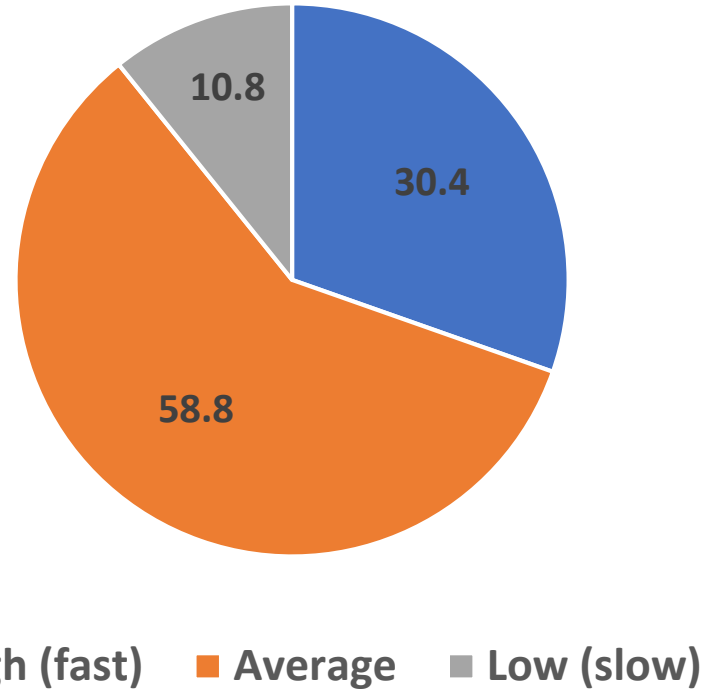
- Glucose 1.36/1,5%: 94%
- Glucose 2.27/2.3%: 13%
- Icodextrin: 100% (for daily dwell)

**Mean APD overall volume:**
**11.0±3.0 L/day**



# I-COPE CKD: *Baseline Peritoneal membrane transport function*

| 3,86% PET (N=97) | |
|---|---|
| Ultrafiltration (ml) | 706±264 |
| Delta Na (mmol/L) | 9±4 |
| 4h D/P creatinine | 0.74±0.12 |



# I-COPE CKD: Primary Outcomes

**ICOPE arm**
(*N*= 205)

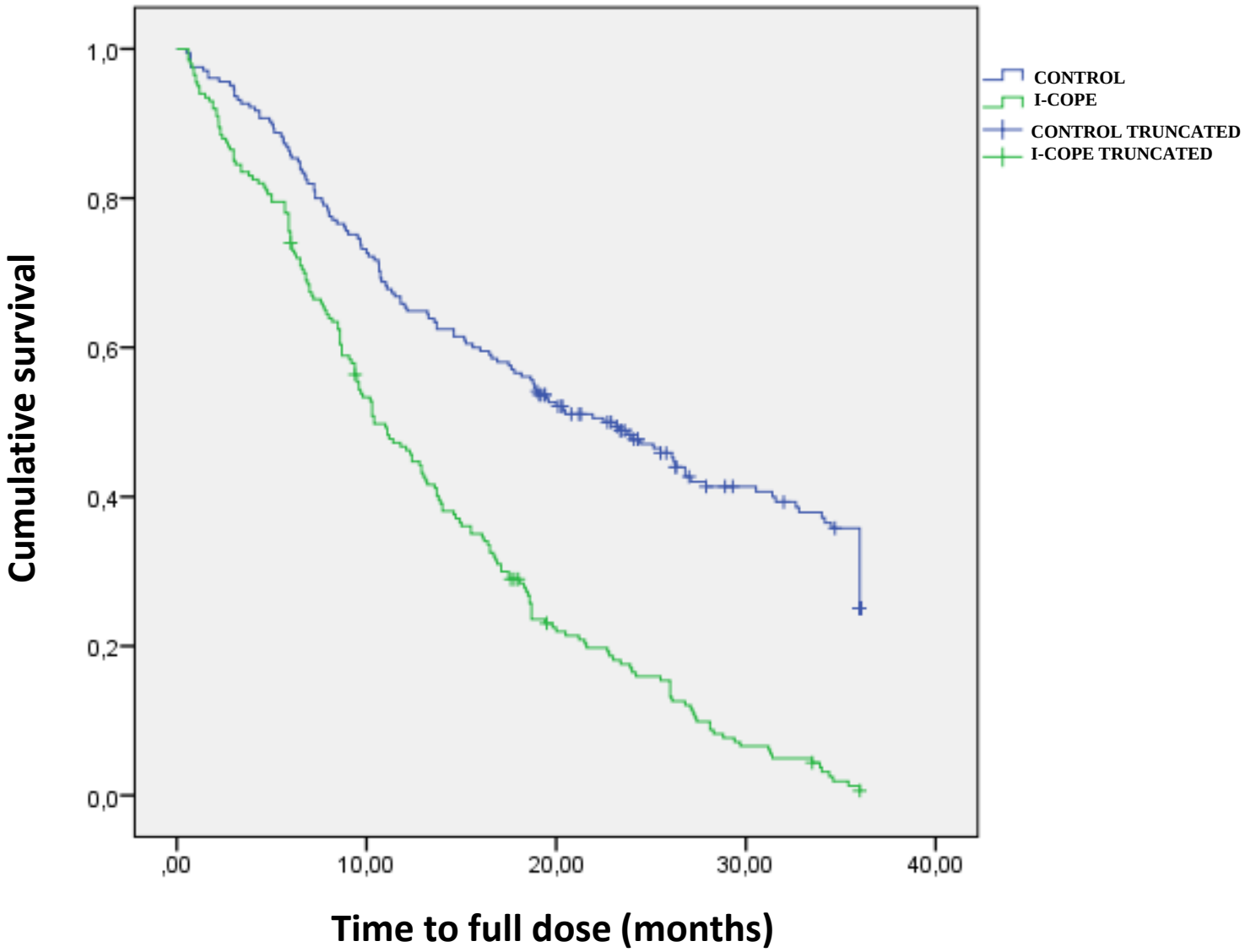
- **Ongoing treatment at 36 months (N=65)**
- **Kidney transplantation (*N*=15)**
- **- Need of full dose PD (*N*=83)**
  **- Shift to hemodialysis (*N*=20)**
- **Death (*N*=22)**

**Control arm**
(*N*= 200)

- **Ongoing treatment at 36 months (N=8)**
- **Kidney transplantation (*N*=1)**
- **- Need of hemodialysis (*N*=178)**
- **Death (*N*=13)**

**Overall median time to full dose 23 [18-27] months in I-COPE and 11 [9-12] months in control arm**
**P<0.001**

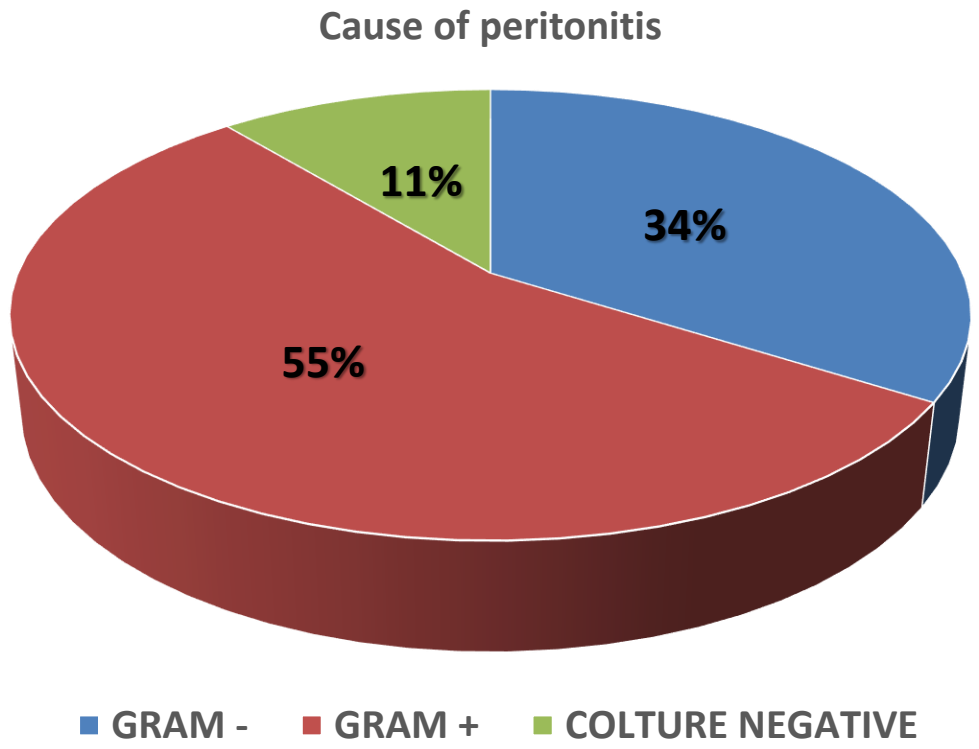
# Kaplan-Meyer analysis for renal survival (time to full dose)



# I-COPE CKD: Safety

**Overall rate of peritonitis: 0.15 episodes/per patients year**

**Time to first peritonitis episode: 11.4 months**



# I-COPE CKD: Nutritional and inflammatory outcomes

| Variable | Baseline | 6 months | 12 months | P |
|---|---|---|---|---|
| Body Weight (Kg) | 70.9±13.9 | 72.1±14.1 | 72.1±14.4 | 0.135 |
| BMI (Kg/m$^2$) | 25.9±4.0 | 26.4±4.1 | 26.3±4.2 | 0.204 |
| Serum Albumin (g/dL) | 3.8±0.5 | 3.8±0.4 | 3.8±0.4 | 0.280 |
| LDL cholesterol (mg/dL) | 91±34 | 101±40 | 101±37 | **0.049** |
| C-Reactive Protein (mg/dL) | 0.99 [0.32-3.28] | 0.67 [0.26-2.9] | 0.75 [0.2-3.17] | 0.095 |
| Lymphocyte count (N) | 1778±878 | 1676±602 | 1654±497 | 0.276 |

**No patient had the need of full dose PD/shift to HD for malnutrition**

# I-COPE approach: possible cost savings

| | 1 Exchange Start | 2 Exchanges Start |
|---|---|---|
| Glucose exposure reduction (kg/patient-year) | 20.4 | 14.8 |
| Free-time gain (days/patient-year) | 18.1 | 13.1 |
| Cost saving (€/patient-year) | 8700 | 6300 |
| Plastic waste reduction (kg/patient-year) | 139.2 | 100.8 |
| Water consumption reduction (L/patient-year) | 25,056 | 18,144 |

**205 PATIENTS TREATED WITH INTEGRATED APPROACH (2 CAPD EXCHANGES) FOR 24 MONTHS: 2.542.200 € LESS THAN FULL DOSE DIALYSIS**

Nardelli, Journal of Nephrology 2023

# CONCLUSIONS

- The initial PD prescription lends itself to a more individualized approach than hemodialysis
- The physician and patient must work together to design a prescription that best fits the patient's lifestyle and achieves the desired clinical goals
- A new approach with comprehensive conservative care including a low salt-low protein diet integrated with low dose of peritoneal dialysis could be a reasonable alternative for patients with advanced CKD and indication to RRT
- I-COPE approach delays the need of full dose dialysis for at least 24 months with a good safety (low rate of mortality and peritonitis)
- Better quality of life and lower costs can be expected with this integrated approach

# A Concluding Thought

**“The secret of the care of the patient is in caring for the patient”.**

**We must pay careful attention to the patient’s lifestyle and his/her needs and desires. Coupled with the appropriate application of physiology and sound medical judgement, this will culminate in a prescription that meets the patient’s clinical needs and is one with which s/he is able to comply.**